U.S. DEPARTMENT OF COMMERCE
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PB-278 525

Cumberland Lake, Clinton, Pulaski, Russell, and Wayne Counties, Kentucky

National Eutrophication Survey, Corvallis, Oreg

Prepared for

Corvallis Environmental Research Lab, Oreg

Jun 77

PB 278 525

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL EUTROPHICATION SURVEY

WORKING PAPER SERIES

CORVALLIS ENVIRONMENTAL RESEARCH LABORATORY - CORVALLIS, OREGON

and

ENVIRONMENTAL MONITORING & SUPPORT LABORATORY - LAS VEGAS, NEVADA

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U. S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

P.O. 600-440

83

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TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.
3. RECIPIENT'S ACCESSION NO. PB278525	
4. TITLE AND SUBTITLE Report on Cumberland Lake, Clinton, PUlaski, Russell and Wayne Counties, Kentucky	5. REPORT DATE Prepared June 1977
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) Anonymous (National Eutrophication Survey Staff)	8. PERFORMING ORGANIZATION REPORT NO. Working Paper # 351
9. PERFORMING ORGANIZATION NAME AND ADDRESS National Eutrophication Survey U.S. Environmental Protection Agency 200 S. W. 35th St. Corvallis, Oregon 97330	10. PROGRAM ELEMENT NO.
	11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS Office of Research and Development U.S. Environmental Protection Agency 401 M Street, S. W. Washington, DC 20460	13. TYPE OF REPORT AND PERIOD COVERED Final - 1974
	14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES
Prepared in cooperation with the U.S. Environmental Protection Agency, National Environmental Research Center, Las Vegas, Nevada 89114

16. ABSTRACT

Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivided according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

KEY WORDS AND DOCUMENT ANALYSIS

17. a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
utrophication lakes nutrients phosphorus nitrogen loading		48G

18. DISTRIBUTION STATEMENT Release unlimited	19. SECURITY CLASS (This Report)	21. NO. OF PAGES 83
	20. SECURITY CLASS (This page)	22. PRICE PC A05/MF A01

EPA Form 2220-1 (9-73)

REPORT

ON

CUMBERLAND LAKE

CLINTON, PULASKI, RUSSELL,

AND WAYNE COUNTIES

KENTUCKY

EPA REGION IV

WORKING PAPER NO. 351

WITH THE COOPERATION OF THE

KENTUCKY DEPARTMENT FOR NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

AND THE

KENTUCKY NATIONAL GUARD

JUNE, 1977

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FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to freshwater lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point-source discharge reduction and non-point source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's fresh water lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by EPA and to augment plans implementation by the states.

ACKNOWLEDGEMENT

The staff of the National Eutrophication Survey (Office of Research & Development, U. S. Environmental Protection Agency) expresses sincere appreciation to the Kentucky Department for Natural Resources and Environmental Protection for professional involvement, to the Kentucky National Guard for conducting the tributary sampling phase of the Survey, and to those Kentucky wastewater treatment plant operators who voluntarily provided effluent samples.

Harold Snodgrass, former Director, and Mercer M. Peters of the Division of Water Quality provided invaluable lake documentation and counsel during the Survey; and the staff of the Division reviewed the preliminary reports and provided critiques most useful in the preparation of this Working Paper series.

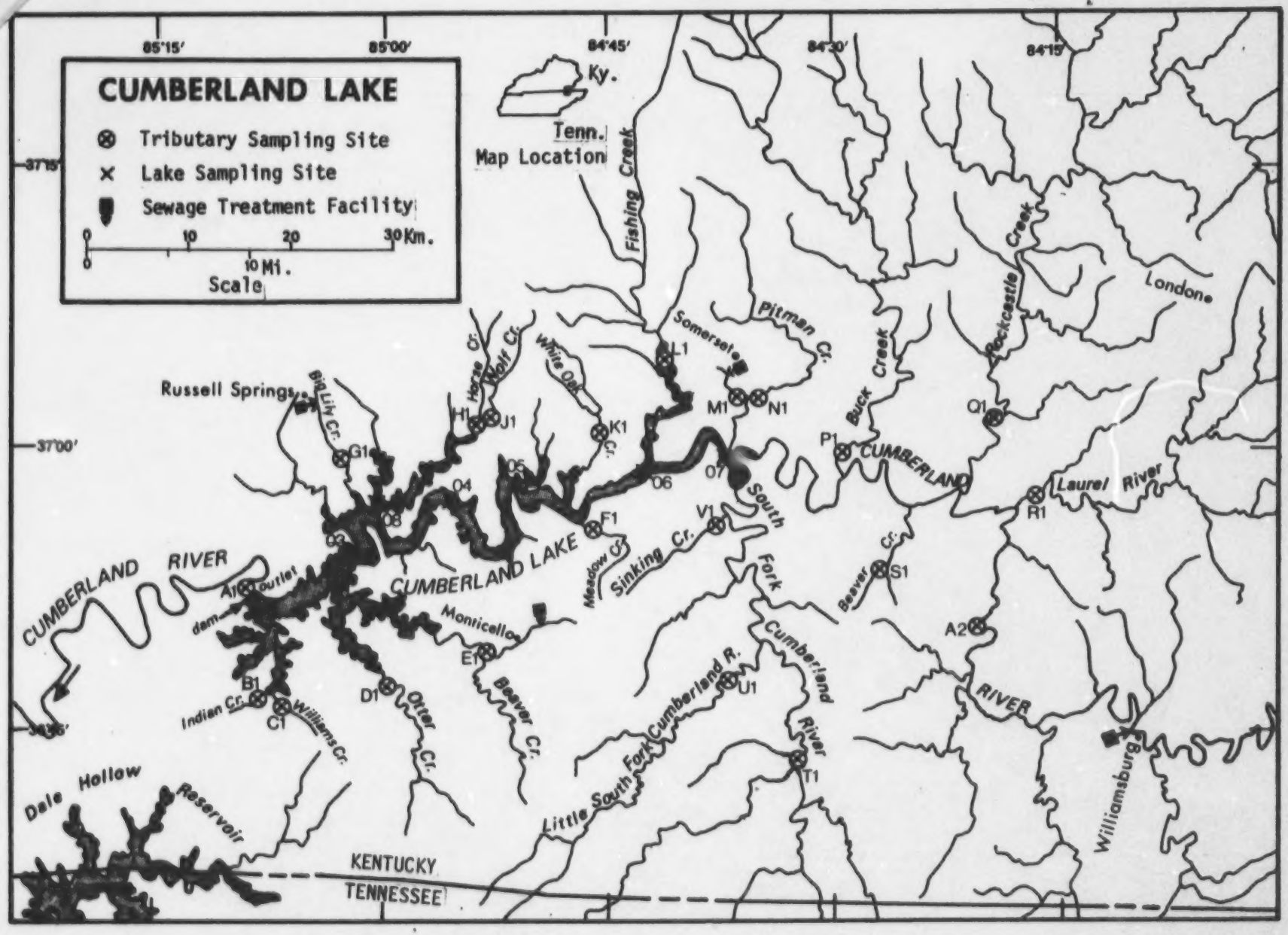
Major General Richard L. Frymire, the Adjutant General of Kentucky, and Project Officers Lt. Colonel Thomas Buyher, Jr., and Lt. Colonel David B. May, who directed the volunteer efforts of the Kentucky National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

NATIONAL EUTROPHICATION SURVEY

STUDY RESERVOIRS

STATE OF KENTUCKY

NAME	COUNTY
Barkley	Lyon, Trigg, KY; Cheatham, Montgomery, Stewart, TN
Barren River	Allen, Barren
Cumberland	Clinton, Pulaski, Russell, Wayne
Dale Hollow	Clinton, Cumberland, KY; Clay, Overton, Pickett, TN
Herrington	Boyler, Garrard, Mercer
Kentucky	Calloway, Livingston, Lyon, Marshall, Trigg, KY; Benton, Decatur, Henry, Houston, Humphreys, Perry, Stewart, TN


CUMBERLAND LAKE
Tributary Sampling Site
Lake Sampling Site
Sewage Treatment Facility
0 10 20 30 Km.
0 10 Mi.
Scale
85°15'
85°00'
84°45'
84°30'
84°15'
37°15'
37°00'
36°45'
Ky.
Tenn.
Map Location
Fishing Creek
Somerset
Pitman Cr.
Buck Creek
Rockcastle Creek
London
Russell Springs
Big Lick Cr.
Horse Cr.
Wolf Cr.
White Oak Cr.
Laurel River
CUMBERLAND RIVER
CUMBERLAND LAKE
Outlet dam
Monticello
Meadow Cr.
Sinking Cr.
South Fork Cumberland River
Beaver Cr.
Otter Cr.
Indian Cr.
Williams Cr.
Little South Fork Cumberland R.
Dale Hollow Reservoir
Williamsburg
KENTUCKY
TENNESSEE
A1
A2
B1
C1
D1
E1
F1
G1
H1
J1
K1
L1
M1
N1
O1
O3
O4
O5
O6
O7
O8
P1
R1
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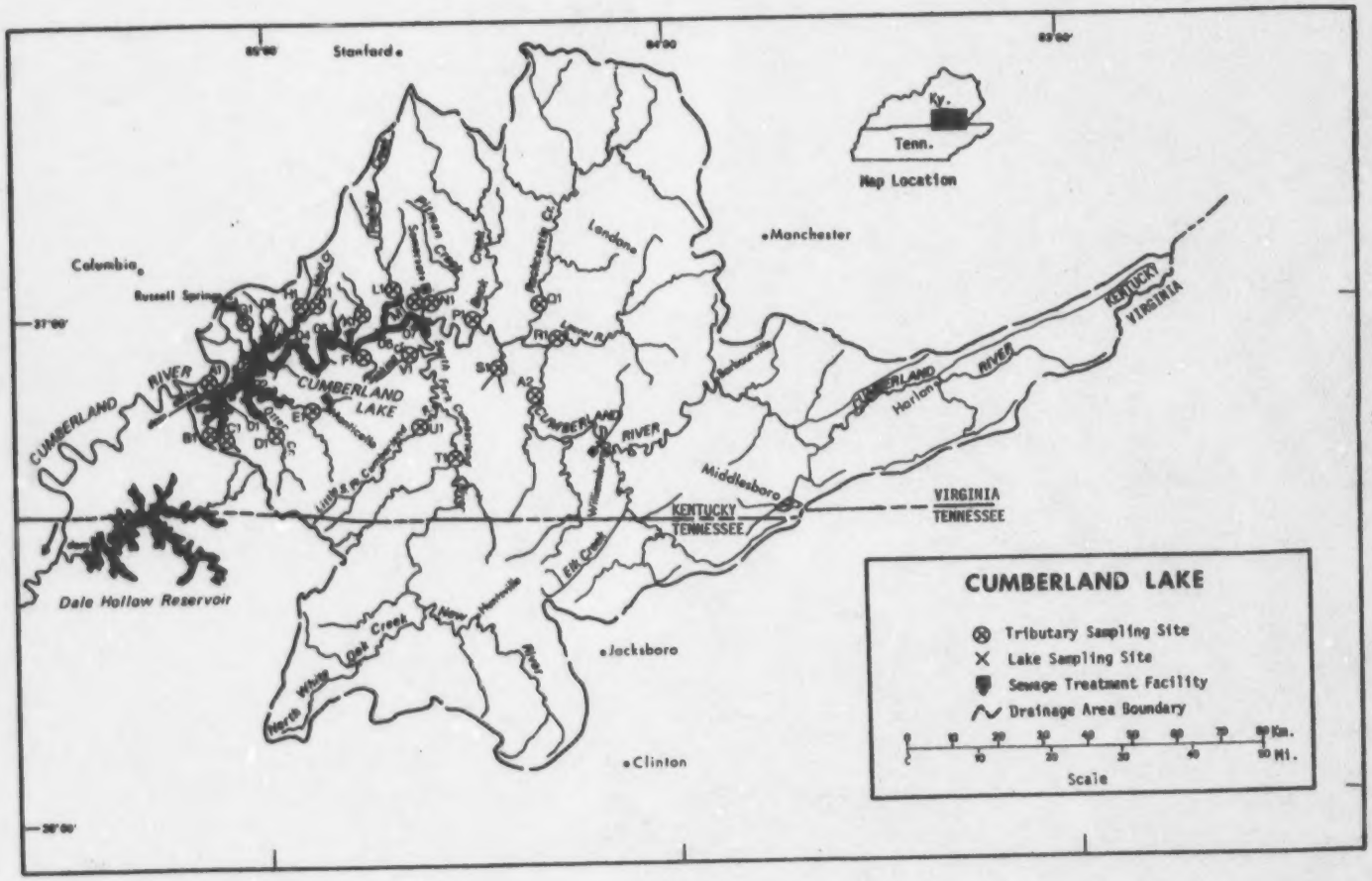
T1
U1
V1


CUMBERLAND LAKE
Tributary Sampling Site
Lake Sampling Site
Sewage Treatment Facility
Drainage Area Boundary
Km.
Mi.
Scale
Map Location
Ky.
Tenn.
Stanford
Columbia
Russell Springs
Manchester
Landon
Middlesboro
Harlan
Jacksboro
Clinton
Dale Hollow Reservoir
CUMBERLAND RIVER
CUMBERLAND LAKE
KENTUCKY
TENNESSEE
VIRGINIA
Elk Creek
Pitman Creek
Oak Creek
North White
New River
Little S. Fk. Cumberland
Otter Cr.
Manticello
Barbourville
Lowell R.
Rockcastle Cr.
Williamsburg
Huntsville
Sumerset
Beck Creek
Pitman Creek
85°00'
84°00'
83°00'
37°00'
36°00'

CUMBERLAND LAKE

STORET NO. 2101

I. CONCLUSIONS

A. Trophic Condition:

Survey data indicate that Cumberland Lake is mesotrophic; i.e., moderately supplied with nutrients and moderately productive. Whether nutrient enrichment is beneficial or deleterious depends on the actual or potential effect on the uses of the lake. In this regard, personnel of the Kentucky Department for Natural Resources and Environmental Protection have indicated there is no known impairment of the beneficial uses of Cumberland Lake.

This water body ranked second in overall trophic quality when the five Kentucky reservoirs sampled in 1973 were compared using a combination of six parameters*. One of the reservoirs had less median total phosphorus, two had less median dissolved phosphorus, one had less median inorganic nitrogen, one had less mean chlorophylll a, and one had greater mean Secchi disc transparency. Marked depression of dissolved oxygen with depth occurred at six of the seven sampling stations in October.

Survey limnologists did not observe macrophytes or surface concentrations of algae during any of the sampling visits; and in a summary report (Anonymous, 1976), it is concluded that this is a mesotrophic reservoir of high water quality which provides a fine sport fishery.

* See Appendix A.

B. Rate-Limiting Nutrient:

The algal assay results indicate the lake was phosphorus limited at the time the samples were collected (05/29/73). The lake data also indicate phosphorus limitation; at all sampling times the mean inorganic nitrogen to orthophosphorus ratios were greater than 30 to 1, and phosphorus limitation would be expected.

C. Nutrient Controllability:

1. Point sources--The phosphorus contributions of the listed point sources accounted for less than 5% of the total input to Cumberland Lake. Somerset contributed 3.1%; Monticello, 1.2%; Russell Springs, 0.5%; and Williamsburg, 0.1%. However, the phosphorus export rates of the Cumberland River and Beaver Creek were significantly higher than the rates of the other tributaries (see page 15). For the Cumberland River, it is likely that point sources beyond the 40-kilometer limit of the Survey* contributed to the phosphorus inputs to Cumberland Lake.

The phosphorus loading of 1.96 g/m^2 measured during the sampling year is over 1.6 times that proposed by Vollenweider (Vollenweider and Dillon, 1974) as a eutrophic loading (see page 16). For this reason, all phosphorus inputs to the reservoir should be minimized to the greatest possible extent to slow the trend toward a eutrophic condition.

2. Non-point sources--The phosphorus load from non-point sources accounted for over 95% of the total reaching Cumberland Lake. About 50% of the phosphorus input can be attributed to the

* See Working Paper No. 175, "...Survey Methods, 1973-1976".

Cumberland River after accounting for the point-source load from the town of Williamsburg. As discussed above, part of the phosphorus load of the Cumberland River may be due to distant point sources rather than non-point source contributions.

Beaver Creek had an apparent phosphorus export rate of 71 $kg/km^2/yr$, which is also much higher than would be expected from non-point sources and could have resulted from an underestimation of the contribution of the Monticello waste treatment facility or to unidentified point sources in that drainage basin.

Among the other tributaries, substantial phosphorus contributions came from the South Fork of the Cumberland River (12.9%) and Rockcastle Creek (10.2%). The 17 additional listed tributaries collectively contributed 15.9% of the total. The ungaged tributaries contributed an estimated 5.3% of the total phosphorus input to the lake.

II. LAKE AND DRAINAGE BASIN CHARACTERISTICS†

A. Morphometry††:

1. Surface area: 203.36 kilometers^2.

2. Mean depth: 24.2 meters.

3. Maximum depth: >56.7 meters.

4. Volume: 4,927.800 x 10^6 m^3.

5. Mean hydraulic retention time: 226 days.

B. Tributary and Outlet:
(See Appendix C for flow data)

1. Tributaries -

Name	Drainage area (km^2)*	Mean flow (m^3/sec)*
Cumberland River	5,180.0	89.47
Indian Creek	22.5	0.30
Williams Creek	21.0	0.28
Otter Creek	174.3	2.39
Beaver Creek	238.3	3.28
Meadow Creek	48.2	0.64
Lily Creek	26.4	0.35
Horse Creek	43.0	0.57
Wolf Creek	43.0	0.57
White Oak Creek	59.3	0.80
Fishing Creek Arm	365.2	5.07
Sinking Creek (M-1)	42.2	0.56
Pitman Creek	192.2	2.94
Buck Creek	758.9	11.73
Rockcastle Creek	1,921.8	30.88
Laurel River	733.0	11.48
Beaver Creek (S-1)	55.7	0.75
South Fork, Cumberland River	2,805.0	55.07
Little S. Fk., Cumberland River	308.2	4.26
Sinking Creek (V-1)	111.4	1.51
Minor tributaries & immediate drainage -	1,640.5	29.94
Totals	14,790.1	252.84**

† Table of metric conversions--Appendix B.
†† At maximum power pool (el. 220 m.): Jett, 1974; Anonymous, 1976.
* For limits of accuracy, see Working Paper No. 175.
** Sum of inflows adjusted to equal outflow.

Name	Drainage area (km^2)*	Mean flow (m^3/sec)*
2. Outlet -		
Cumberland River	14,993.5**	252.84

C. Precipitation***:

1. Year of sampling: 150.0 centimeters.

2. Mean annual: 120.6 centimeters.

* For limits of accuracy, see Working Paper No. 175.
** Includes area of lake.
*** See Working Paper No. 175.

III. WATER QUALITY SUMMARY

Cumberland Lake was sampled three times in 1973 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from seven stations on the lake and from a number of depths at each station (see map, page v). During each visit, a single depth-integrated (4.6 m to surface) sample was composited from the stations for phytoplankton identification and enumeration; and during the first visit, two 18.9-liter depth-integrated samples were composited for algal assays. Also each time, a depth-integrated sample was collected from each of the stations for chlorophyll a analysis. The maximum depths sampled were 56.7 meters at station 1, 44.2 meters at station 2, 30.5 meters at station 3, 39.6 meters at station 4, 40.2 meters at station 5, 36.3 meters at station 6, and 25.6 meters at station 7.

The sampling results are presented in full in Appendix D and are summarized in the following table.

A. SUMMARY OF PHYSICAL AND CHEMICAL CHARACTERISTICS FOR LAKE CUMBERLAND
STORET CODE 2101

PARAMETER	1ST SAMPLING (5/29/73) 7 SITES RANGE	MEAN	MEDIAN	2ND SAMPLING (8/21/73) 7 SITES RANGE	MEAN	MEDIAN	3RD SAMPLING (10/25/73) 7 SITES RANGE	MEAN	MEDIAN
TEMP (C)	9.4 - 19.8	15.6	16.6	9.7 - 28.1	20.9	21.5	10.7 - 23.2	19.3	21.4
DISS OXY (MG/L)	8.0 - 9.8	9.0	9.0	2.2 - 9.1	5.8	5.2	0.1 - 7.2	4.1	5.8
CNDCTVY (MCROMO)	****** -**********			85. - 205.	135.	136.	95. - 177.	130.	130.
PH (STAND UNITS)	7.3 - 7.7	7.5	7.5	5.9 - 8.8	7.0	6.9	6.7 - 7.6	7.1	7.3
TOT ALK (MG/L)	25. - 56.	38.	36.	27. - 59.	38.	36.	26. - 53.	39.	39.
TOT P (MG/L)	0.012 - 0.069	0.023	0.018	0.007 - 0.056	0.017	0.013	0.008 - 0.054	0.019	0.015
ORTHO P (MG/L)	0.002 - 0.025	0.007	0.006	0.004 - 0.022	0.007	0.006	0.005 - 0.013	0.008	0.008
NO2+NO3 (MG/L)	0.220 - 0.420	0.303	0.300	0.050 - 0.520	0.273	0.340	0.100 - 0.440	0.206	0.130
AMMONIA (MG/L)	0.030 - 0.140	0.051	0.040	0.040 - 0.080	0.055	0.050	0.030 - 0.230	0.047	0.040
KJEL N (MG/L)	0.200 - 0.500	0.263	0.300	0.200 - 0.600	0.265	0.200	0.200 - 0.800	0.260	0.200
INORG N (MG/L)	0.280 - 0.480	0.354	0.340	0.090 - 0.560	0.328	0.405	0.140 - 0.480	0.253	0.180
TOTAL N (MG/L)	0.420 - 0.740	0.566	0.570	0.260 - 0.760	0.538	0.580	0.300 - 0.920	0.466	0.420
CHLRPYL A (UG/L)	1.1 - 2.4	1.8	1.8	3.6 - 8.5	7.1	7.6	1.7 - 3.9	2.6	2.4
SECCHI (METERS)	0.1 - 1.8	1.1	1.0	1.0 - 2.4	1.6	1.5	1.5 - 3.0	2.5	2.7

B. Biological characteristics:

1. Phytoplankton -

Sampling Date	Dominant Genera	Algal Units per ml
05/29/73	1. Flagellates	447
	2. *Fragilaria sp.*	394
	3. *Dinobryon sp.*	105
	4. *Cryptomonas sp.*	79
	5. *Stephanodiscus sp.*	66
	Other genera	79
	Total	1,170
08/21-22/73	1. *Anomoeoneis sp.*	5,132
	2. Flagellates	572
	3. *Cosmarium sp.*	248
	4. *Cyclotella sp.*	133
	5. *Fragilaria sp.*	57
	Other genera	173
	Total	6,315
10/25/73	1. *Anomoeoneis sp.*	628
	2. Flagellates	107
	3. *Synedra sp.*	107
	4. *Fragilaria sp.*	92
	5. *Cyclotella sp.*	61
	Other genera	154
	Total	1,149

2. Chlorophyll *a* -

Sampling Date	Station Number	Chlorophyll *a* (μg/l)
05/29/73	1	1.1
	2	1.8
	3	2.4
	4	2.3
	5	2.3
	6	1.2
	7	1.2
08/21-22/73	1	7.5
	2	8.0
	3	7.9
	4	7.6
	5	8.5
	6	6.4
	7	3.6

Sampling Date	Station Number	Chlorophyll a (μg/l)
10/25/73	1	3.9
	2	3.6
	3	2.5
	4	1.7
	5	1.7
	6	2.3
	7	2.4

C. Limiting Nutrient Study:

1. Autoclaved, filtered, and nutrient spiked -

a. Stations 1, 2, and 3 -

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum yield (mg/l-dry wt.)
Control	0.004	0.348	0.1
0.050 P	0.054	0.348	4.9
0.050 P + 1.0 N	0.054	1.348	15.4
1.0 N	0.004	1.348	0.1

b. Stations 4, 5, 6, and 7 -

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum yield (mg/l-dry wt.)
Control	0.024	0.296	0.1
0.050 P	0.074	0.296	4.4
0.050 P + 1.0 N	0.074	1.296	16.7
1.0 N	0.024	1.296	0.1

2. Discussion -

The control yields of the assay alga, Selenastrum capricornutum, indicate the potential primary productivity of Cumberland Reservoir was low at the time the samples were collected (05/29/73). In both assays, the significant increases in yield with the addition of phosphorus alone indicate phosphorus limitation. Note that in neither assay did the addition of nitrogen alone result in an increase in

yield.

The lake data also indicate phosphorus limitation. The mean inorganic nitrogen to orthophosphorus ratios were 32 to 1 or greater at all sampling times.

IV. NUTRIENT LOADINGS
(See Appendix E for data)

For the determination of nutrient loadings, the Kentucky National Guard collected monthly near-surface grab samples from each of the tributary sites indicated on the map (page v), except for the months of May, 1973, and January and February, 1974, when two samples were collected at most of the sites. Sampling was begun in March, 1973, and was completed in March, 1974.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or average year were provided by the Kentucky District Office of the U.S. Geological Survey for the tributary sites nearest the lake.

Except for Sinking Creek (M-1), nutrient loads for sampled tributaries were determined by using a modification of a U.S. Geological Survey computer program for calculating stream loadings*. Nutrient loads shown are those measured minus point-source loads, if any.

The nutrient loads measured at the Somerset wastewater treatment plant exceeded the loads measured in Sinking Creek at station M-1; the nutrient loads for this stream and the unsampled "minor tributaries and immediate drainage" ("ZZ" of U.S.G.S.) were estimated using the means of the nutrient exports, in kg/km^2/year, at stations B-1, C-1, D-1, F-1, H-1, J-1, K-1, L-1, N-1, P-1, Q-1, R-1, S-1, T-1, U-1, and V-1 and multiplying the means by the M-1 and ZZ areas in km^2.

The operators of the Monticello, Williamsburg, and Somerset waste-

* See Working Paper No. 175.

water treatment plants provided monthly effluent samples and corresponding flow data. The operator of the Russell Springs treatment plant did not participate in the sampling program, and nutrient loads were estimated at 1.134 kg P and 3.401 kg N/capita/year.

A. Waste Sources:

1. Known municipal† -

Name	Pop. Served*	Treatment	Mean Flow (m^3/d)	Receiving Water
Russell Springs	1,641	trickling filter	621.1**	Lily Creek
Monticello	3,618	trickling filter	927.7	Elk Spring Creek/ Beaver Creek
Williamsburg	3,687	trickling filter	923.3	Cumberland River
Somerset	10,436	act. sludge	5,659.2	Sinking Creek (M-1)

2. Known industrial - None

† Anonymous, 1971.
* 1970 Census.
** Estimated at 0.3785 m^3/capita/day.

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

Source	kg P/ yr	% of total
a. Tributaries (non-point load) -		
Cumberland River	198,405	49.9
Indian Creek	235	0.1
Williams Creek	180	<0.1
Otter Creek	1,020	0.3
Beaver Creek (E-1)	16,810	4.2
Meadow Creek	785	0.2
Lily Creek	645	0.2
Horse Creek	440	0.1
Wolf Creek	370	0.1
White Oak Creek	530	0.1
Fishing Creek Arm	4,900	1.2
Sinking Creek (M-1)	535	0.1
Pitman Creek	4,190	1.1
Buck Creek	11,845	3.0
Rockcastle Creek	40,745	10.2
Laurel River	17,655	4.4
Beaver Creek (S-1)	205	<0.1
South Fork, Cumberland River	51,225	12.9
Little S. Fk., Cumberland River	2,465	0.6
Sinking Creek (V-1)	940	0.2
b. Minor tributaries & immediate drainage (non-point load) -	20,835	5.3
c. Known municipal STP's -		
Russell Springs	1,860	0.5
Monticello	4,695	1.2
Williamsburg	300	0.1
Somerset	12,375	3.1
d. Septic tanks* -	20	<0.1
e. Known industrial - None	-	-
f. Direct precipitation** -	3,560	0.9
Total	397,770	100.0

2. Outputs -

Lake outlet - Cumberland River 243,735

3. Net annual P accumulation - 154,035 kg.

* Estimate based on 73 shoreline dwellings; see Working Paper No. 175.
** See Working Paper No. 175.

C. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

Source	kg N/ yr	% of total
a. Tributaries (non-point load) -		
Cumberland River	3,748,075	37.3
Indian Creek	15,680	0.2
Williams Creek	13,565	0.1
Otter Creek	73,170	0.7
Beaver Creek (E-1)	186,655	1.9
Meadow Creek	27,120	0.3
Lily Creek	11,465	0.1
Horse Creek	21,865	0.2
Wolf Creek	19,985	0.2
White Oak Creek	28,875	0.3
Fishing Creek Arm	205,675	2.0
Sinking Creek (M-1)	22,685	0.2
Pitman Creek	131,815	1.3
Buck Creek	408,005	4.1
Rockcastle Creek	2,319,940	23.1
Laurel River	573,855	5.7
Beaver Creek (S-1)	14,325	0.1
S. Fork, Cumberland River	990,995	9.9
Little S. Fk., Cumberland R.	69,195	0.7
Sinking Creek (V-1)	22,615	0.2
b. Minor tributaries & immediate drainage (non-point load) -	881,935	8.8
c. Known municipal STP's -		
Russell Springs	5,580	0.1
Monticello	10,515	0.1
Williamsburg	840	<0.1
Somerset	19,740	0.2
d. Septic tanks* -	780	<0.1
e. Known industrial - None	-	-
f. Direct precipitation** -	219,545	2.2
Total	10,044,495	100.0

2. Outputs -

Lake outlet - Cumberland R. 7,234,410

3. Net annual N accumulation - 2,810,085 kg.

* Estimate based on 73 shoreline dwellings; see Working Paper No. 175.
** See Working Paper No. 175.

D. Non-point Nutrient Export by Subdrainage Area:

Tributary	kg P/km²/yr	kg N/km²/yr
Cumberland River	38	724
Indian Creek	10	697
Williams Creek	9	646
Otter Creek	6	420
Beaver Creek (E-1)	71	783
Meadow Creek	16	563
Lily Creek	24	434
Horse Creek	10	508
Wolf Creek	9	465
White Oak Creek	9	487
Fishing Creek Arm	13	563
Pitman Creek	22	686
Buck Creek	16	538
Rockcastle Creek	21	1,207
Laurel River	24	783
Beaver Creek (S-1)	4	257
South Fork, Cumberland River	18	353
Little S. Fk., Cumberland River	8	225
Sinking Creek (V-1)	8	203

E. Yearly Loadings:

In the following table, the existing phosphorus loadings are compared to those proposed by Vollenweider (Vollenweider and Dillon, 1974). Essentially, his "dangerous" loading is one at which the receiving water would become eutrophic or remain eutrophic; his "permissible" loading is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A mesotrophic loading would be considered one between "dangerous" and "permissible".

Note that Vollenweider's model may not be applicable to water bodies with short hydraulic retention times.

	Total Phosphorus		Total Nitrogen	
	Total	Accumulated	Total	Accumulated
grams/m^2/yr	1.96	0.76	49.4	13.8

Vollenweider phosphorus loadings ($g/m^2/yr$) based on mean depth and mean hydraulic retention time of Cumberland Reservoir:

"Dangerous" (eutrophic loading)	1.20
"Permissible" (oligotrophic loading)	0.60

V. LITERATURE REVIEWED

Anonymous, 1971. Inventory of municipal waste facilities. EPA Publ. OWP-1, Vol. 4, Wash., D.C.

Anonymous, 1976. Water quality conditions in Lake Cumberland. Nashville Distr., U.S. Corps of Engineers, Nashville, TN.

Jett, Shelby, 1974. Personal communication (lake morphometry). Dept. for Nat. Resources & Env. Protection, Frankfort.

Vollenweider, R. A., and P. J. Dillon, 1974. The application of the phosphorus loading concept to eutrophication research. Natl. Res. Council of Canada Publ. No. 13690, Canada Centre for Inland Waters, Burlington, Ontario.

VI. APPENDICES

APPENDIX A

LAKE RANKINGS

LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS P
2101	LAKE CUMBERLAND-	0.016	0.330	432.381	3.805	14.900	0.007
2102	DALE HOLLOW RESERVOIR	0.010	0.270	330.000	3.594	14.800	0.005
2103	HERRINGTON LAKE	0.079	0.550	442.667	14.908	14.900	0.047
2104	KENTUCKY LAKE	0.072	0.520	461.972	9.089	12.600	0.030
2105	BARREN RIVER RESERVOIR	0.027	0.460	452.594	8.216	14.900	0.006

PERCENT OF LAKES WITH HIGHER VALUES

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS P	INDE NO
2101	LAKE CUMBERLAND	60 (3)	60 (3)	60 (3)	60 (3)	20 (0)	40 (2)	300
2102	DALE HOLLOW RESERVOIR	80 (4)	80 (4)	80 (4)	80 (4)	60 (3)	80 (4)	460
2103	HERRINGTON LAKE	0 (0)	0 (0)	40 (2)	0 (0)	20 (0)	0 (0)	60
2104	KENTUCKY LAKE	20 (1)	20 (1)	0 (0)	20 (1)	80 (4)	20 (1)	160
2105	BARREN RIVER RESERVOIR	40 (2)	40 (2)	20 (1)	40 (2)	20 (0)	60 (3)	220

LAKES RANKED BY INDEX NOS.

RANK	LAKE CODE	LAKE NAME	INDEX NO
1	2102	DALE HOLLOW RESERVOIR	460
2	2101	LAKE CUMBERLAND	300
3	2105	BARREN RIVER RESERVOIR	220
4	2104	KENTUCKY LAKE	160
5	2103	HERRINGTON LAKE	60

APPENDIX B

CONVERSION FACTORS

CONVERSION FACTORS

Hectares x 2.471 = acres

Kilometers x 0.6214 = miles

Meters x 3.281 = feet

Cubic meters x 8.107×10^{-4} = acre/feet

Square kilometers x 0.3861 = square miles

Cubic meters/sec x 35.315 = cubic feet/sec

Centimeters x 0.3937 = inches

Kilograms x 2.205 = pounds

Kilograms/square kilometer x 5.711 = lbs/square mile

APPENDIX C

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR KENTUCKY 2/3/75

LAKE CODE 2101 LAKE CUMBERLAND

TOTAL DRAINAGE AREA OF LAKE(SQ KM) 14993.5

TRIBUTARY	SUB-DRAINAGE AREA(SQ KM)	NORMALIZED FLOWS(CMS) JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
2101A1	14993.5	325.08	322.81	431.27	457.60	322.25	208.58	186.44	172.48	121.25	114.99	149.03	226.70	252.84
2101A2	5180.0	167.21	185.25	211.67	142.83	87.36	45.08	41.68	25.51	12.91	15.52	45.51	98.77	89.47
2101B1	22.5	0.45	0.65	0.82	0.45	0.31	0.14	0.13	0.06	0.04	0.03	0.15	0.34	0.30
2101C1	21.0	0.42	0.62	0.76	0.42	0.28	0.13	0.12	0.05	0.04	0.03	0.14	0.31	0.28
2101D1	174.3	3.94	5.24	6.31	3.68	2.41	1.22	1.05	0.54	0.37	0.26	1.19	2.63	2.39
2101E1	238.3	5.47	7.16	8.64	5.04	3.28	1.67	1.44	0.76	0.51	0.37	1.64	3.62	3.28
2101F1	48.2	1.02	1.42	1.76	0.99	0.68	0.31	0.28	0.13	0.09	0.07	0.31	0.71	0.64
2101G1	26.4	0.54	0.76	0.96	0.54	0.37	0.17	0.15	0.07	0.05	0.04	0.18	0.40	0.35
2101H1	43.0	0.91	1.27	1.56	0.88	0.59	0.28	0.25	0.12	0.08	0.06	0.28	0.65	0.57
2101J1	43.0	0.91	1.27	1.56	0.88	0.59	0.28	0.25	0.12	0.08	0.06	0.28	0.65	0.57
2101K1	59.3	1.27	1.76	2.15	1.22	0.82	0.40	0.34	0.17	0.12	0.08	0.40	0.88	0.80
2101L1	365.2	8.55	11.04	13.22	7.82	5.01	2.63	2.24	1.22	0.82	0.57	2.52	5.58	5.07
2101M1	42.2	0.88	1.25	1.53	0.88	0.59	0.27	0.25	0.12	0.08	0.06	0.28	0.62	0.56
2101N1	192.2	4.56	7.50	7.73	4.84	2.32	1.44	1.36	0.48	0.45	0.28	1.02	3.60	2.94
2101P1	758.9	18.15	29.08	30.72	18.60	10.25	7.19	6.54	1.81	1.08	0.62	4.13	13.68	11.73
2101Q1	1921.8	58.36	70.06	74.16	46.52	26.22	18.55	15.80	7.22	3.31	2.27	14.92	35.65	30.88
2101R1	733.0	23.30	26.65	26.70	15.46	9.80	6.12	4.53	1.67	1.44	0.74	6.23	16.03	11.48
2101S1	55.7	1.19	1.64	2.01	1.13	0.79	0.37	0.34	0.16	0.11	0.08	0.37	0.82	0.75
2101T1	2805.0	109.30	128.42	125.19	79.77	46.72	22.77	18.97	8.30	8.27	7.39	31.60	78.75	55.07
2101U1	308.2	7.14	9.29	11.16	6.57	4.25	2.21	1.87	1.02	0.68	0.48	2.12	4.70	4.26
2101V1	111.4	2.46	3.31	4.02	2.32	1.56	0.76	0.65	0.34	0.23	0.16	0.76	1.67	1.51
2101ZZ	1642.1	41.40	50.38	59.44	36.16	22.23	12.74	10.34	6.26	3.99	27.78	11.44	25.46	25.54

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 14993.5
SUM OF SUB-DRAINAGE AREAS = 14791.4

TOTAL FLOW IN = 2999.12
TOTAL FLOW OUT = 3038.48

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
2101A1	3	73	459.58						
	4	73	498.38	1	781.54	28	137.05		
	5	73	434.95						
	6	73	530.94	17	605.98				
	7	73	501.77	22	453.07				
	8	73	314.03	19	140.17				
	9	73	124.06	16	15.46				
	10	73	178.48	14	99.68				
	11	73	215.94	18	4.02				
	12	73	507.44						
	1	74	1041.49	5	914.63	20	1121.35		
	2	74	907.84	2	1112.85	17	846.67		
	3	74	524.14	17	645.62				

TRIBUTARY FLOW INFORMATION FOR KENTUCKY 2/3/75

LAKE CODE 2101 LAKE CUMBERLAND

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
2101A2	3	73	336.97						
	4	73	150.08	14	110.15	15	93.45		
	5	73	223.70	12	237.86	13	193.12		
	6	73	93.98	17	114.40				
	7	73	83.82	30	67.39	31	56.35		
	8	73	45.19	18	21.12	19	18.41		
	9	73	15.38	22	12.03	23	10.82		
	10	73	20.76	30	71.92	31	64.00		
	11	73	176.13	10	38.51	11	32.00		
	12	73	251.74						
	1	74	404.93	12	716.42	13	1030.73	15	688.10
	1	74	404.93	16	495.54				
	2	74	189.16						
	3	74	199.07						
2101B1	3	73	1.08	31	0.54				
	4	73	0.48	29	0.68				
	5	73	0.96						
	6	73	0.42	17	0.54				
	7	73	0.26	22	0.02				
	8	73	0.04	19	0.02				
	9	73	0.02	16	0.02				
	10	73	0.01	14	0.01				
	11	73	0.45	18	0.05				
	12	73	0.68						
	1	74	1.44	5	1.22	20	0.25		
	2	74	0.68	2	2.38	17	0.34		
	3	74	0.65	17	0.37				
2101C1	3	73	0.99	31	0.51				
	4	73	0.45	29	0.65				
	5	73	0.85						
	6	73	0.37	17	0.45				
	7	73	0.25	22	0.02				
	8	73	0.03	19	0.18				
	9	73	0.02	16	0.02				
	10	73	0.01	14	0.01	20	0.01		
	11	73	0.42	18	0.04				
	12	73	0.62						
	1	74	1.36	5	1.13	20	0.23		
	2	74	0.65	2	2.29	17	0.31		
	3	74	0.62	17	0.37				

TRIBUTARY FLOW INFORMATION FOR KENTUCKY 2/3/75

LAKE CODE 2101 LAKE CUMBERLAND

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
2101D1	3	73	8.27						
	4	73	3.91	1	3.68	29	5.64		
	5	73	7.33						
	6	73	3.57	17	4.50				
	7	73	2.12	22	0.18				
	8	73	0.34	19	0.18				
	9	73	0.16	16	0.16				
	10	73	0.12	14	0.12				
	11	73	3.60	18	0.37				
	12	73	5.18						
	1	74	12.52	5	10.51	20	2.12		
	2	74	5.44	2	19.14	17	2.61		
	3	74	5.13	17	2.97				
2101E1	3	73	11.30						
	4	73	5.27	1	4.96	28	14.27		
	5	73	10.08						
	6	73	4.76	17	6.00				
	7	73	2.92	22	0.24				
	8	73	0.45	19	0.24				
	9	73	0.22	16	0.22				
	10	73	0.16	14	0.16				
	11	73	4.90	18	0.48				
	12	73	7.08						
	1	74	16.82	4	40.49	19	3.00		
	2	74	7.45	1	5.04	16	3.37		
	3	74	6.97	16	4.19				
2101F1	3	73	2.29						
	4	73	1.05	1	0.99	28	2.83		
	5	73	2.07	13	1.25				
	6	73	0.91	10	0.68				
	7	73	0.57	7	0.34				
	8	73	0.08	19	0.05				
	9	73	0.04	16	0.04				
	10	73	0.03						
	11	73	0.93	17	0.14				
	12	73	1.39						
	1	74	3.23	5	2.72	20	0.57		
	2	74	1.47	3	4.93	16	0.65		
	3	74	1.42	30	1.98				
2101G1	3	73	1.05	31	0.54				
	4	73	0.62	28	1.16				
	5	73	0.88	13	0.91				
	6	73	0.37	10	0.08				
	7	73	0.37	7	0.31				
	8	73	0.04	19	0.03				
	9	73	0.03	16	0.03				
	10	73	0.03	20	0.02				
	11	73	0.59	17	0.06				
	12	73	0.40						
	1	74	1.33	5	1.02	20	0.45		
	2	74	0.45	3	1.13	16	0.21		
	3	74	0.57	30	1.64				

TRIBUTARY FLOW INFORMATION FOR KENTUCKY 2/3/75

LAKE CODE 2101 LAKE CUMBERLAND

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
2101H1	3	73	1.70	31	0.88				
	4	73	1.05	28	1.95				
	5	73	1.42	13	1.44				
	6	73	0.62	10	0.14				
	7	73	0.59	7	0.51				
	8	73	0.07	19	0.05				
	9	73	0.06	16	0.05				
	10	73	0.05	20	0.03				
	11	73	0.96	17	0.10				
	12	73	0.65						
	1	74	2.21	5	1.70	20	0.74		
	2	74	0.76	3	1.93	16	0.37		
	3	74	0.91	30	2.63				
2101J1	3	73	1.70	31	0.88				
	4	73	1.05	28	1.95				
	5	73	1.42	13	1.44				
	6	73	0.62	10	0.14				
	7	73	0.59	7	0.51				
	8	73	0.07	19	0.05				
	9	73	0.06	16	0.05				
	10	73	0.05	20	0.03				
	11	73	0.96	17	0.10				
	12	73	0.65						
	1	74	2.21	5	1.70	20	0.74		
	2	74	0.76	3	1.93	16	0.37		
	3	74	0.91	30	2.63				
2101K1	3	73	1.84	31	1.44				
	4	73	1.42	28	4.02				
	5	73	2.75	13	1.50				
	6	73	1.08	10	0.79				
	7	73	0.48	7	0.42				
	8	73	0.13	19	0.05				
	9	73	0.01	16	0.02				
	10	73	0.02	20	0.01				
	11	73	1.73	17	0.03				
	12	73	1.39						
	1	74	4.64	5	3.11	20	1.53		
	2	74	0.88	3	1.76	16	0.37		
	3	74	1.59	30	1.27				
2101L1	3	73	11.24						
	4	73	9.06	1	7.53	28	25.82		
	5	73	16.68	13	9.17				
	6	73	7.16	10	5.30				
	7	73	3.17	7	2.75				
	8	73	0.93	19	0.37				
	9	73	0.07	16	0.13				
	10	73	0.11						
	11	73	10.93	17	0.21				
	12	73	8.81						
	1	74	31.15	5	20.90	26	17.16		
	2	74	5.52	3	10.99	16	2.27		
	3	74	9.80	30	7.93				

TRIBUTARY FLOW INFORMATION FOR KENTUCKY 2/3/75

LAKE CODE 2101 LAKE CUMBERLAND

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
2101M1	3	73	1.30						
	4	73	1.02	1	0.85	28	2.92		
	5	73	1.98	13	1.08				
	6	73	0.74	10	0.54				
	7	73	0.34	7	0.28				
	8	73	0.09						
	9	73	0.01	16	0.01				
	10	73	0.01	20	0.00				
	11	73	1.22	17	0.02				
	12	73	0.99						
	1	74	3.20	5	2.15	26	1.76		
	2	74	0.62	16	0.25				
	3	74	1.13	30	0.91				
2101N1	3	73	6.57						
	4	73	5.61	1	4.64	28	15.97		
	5	73	7.73	13	4.25				
	6	73	3.94	10	2.92				
	7	73	1.93	7	1.67				
	8	73	0.37	19	0.15				
	9	73	0.04	16	0.07				
	10	73	0.06	20	0.02				
	11	73	4.42						
	12	73	5.69						
	1	74	16.65	5	11.16	26	9.15		
	2	74	3.74	16	1.53				
	3	74	5.72	30	4.64				
2101P1	3	73	26.11						
	4	73	21.52	1	17.87	28	61.45		
	5	73	34.21	13	18.80				
	6	73	19.57	10	14.47				
	7	73	9.23	7	8.04				
	8	73	1.39	19	0.57				
	9	73	0.10	16	0.17				
	10	73	0.13						
	11	73	17.90	17	0.34				
	12	73	21.63						
	1	74	66.26	5	44.46	26	36.53		
	2	74	14.64	3	29.17	16	6.00		
	3	74	22.68	30	18.38				
2101Q1	3	73	67.54	31	65.13				
	4	73	64.02						
	5	73	65.92	12	71.64				
	6	73	29.93	17	69.94				
	7	73	22.00	22	4.73				
	8	73	6.00	19	2.94				
	9	73	1.05	22	0.45				
	10	73	1.19	13	1.50				
	11	73	49.84	10	4.28				
	12	73	45.87	8	10.70				
	1	74	258.53	12	807.03	27	96.28		
	2	74	41.06	9	37.66				
	3	74	70.79	9	54.37				

TRIBUTARY FLOW INFORMATION FOR KENTUCKY 2/3/75

LAKE CODE 2101 LAKE CUMBERLAND

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
2101R1	3	73	46.38	31	33.41				
	4	73	32.73						
	5	73	29.51	12	23.84				
	6	73	16.51	17	20.93				
	7	73	17.50	22	1.78				
	8	73	7.45	19	1.73				
	9	73	1.13	22	0.76				
	9	73	0.99	22	0.07				
	10	73	0.07	13	0.07				
	11	73	0.07	10	0.07				
	12	73	0.07	8	0.07				
	1	74	0.07	12	0.07	27	0.07		
	2	74	0.07	9	0.07				
	3	74	0.07	9	0.07				
2101S1	3	73	1.84						
	4	73	1.56	1	1.42	28	6.88		
	5	73	1.98	13	1.56				
	6	73	0.59	10	0.51				
	7	73	0.48	7	0.65				
	8	73	0.13	19	0.07				
	9	73	0.03	22	0.01				
	10	73	0.04	20	0.03				
	11	73	1.22	17	0.17				
	12	73	1.05						
	1	74	5.27	5	3.28	27	1.95		
	2	74	0.96	3	2.44	16	0.42		
	3	74	1.90	30	1.44				
2101T1	3	73	203.60						
	4	73	94.58	1	106.75	28	356.79		
	5	73	179.81						
	6	73	89.48	16	83.82				
	7	73	50.40	22	10.76				
	8	73	20.33	19	10.42				
	9	73	6.26	16	9.77				
	10	73	5.80	14	4.81				
	11	73	119.78						
	12	73	124.59						
	1	74	261.65	4	453.07	19	54.93		
	2	74	133.94	1	97.41	16	54.65		
	3	74	128.28	16	55.22				

TRIBUTARY FLOW INFORMATION FOR KENTUCKY 2/3/75

LAKE CODE 2101 LAKE CUMBERLAND

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
2101U1	3	73	14.61						
	4	73	6.97	1	6.54	28	18.89		
	5	73	12.97						
	6	73	6.48	16	7.39				
	7	73	3.77	22	0.31				
	8	73	0.65	19	0.34				
	9	73	0.31	16	0.31				
	10	73	0.22	14	0.22				
	11	73	6.40	18	0.65				
	12	73	9.26						
	1	74	22.68	4	54.65	19	4.08		
	2	74	9.66	1	6.57	16	4.33		
	3	74	9.03	16	5.41				
2101V1	3	73	5.27						
	4	73	2.46	1	2.32	28	6.68		
	5	73	4.76	13	2.86				
	6	73	2.24						
	7	73	1.30						
	8	73	0.22						
	9	73	0.10						
	10	73	0.08						
	11	73	2.32						
	12	73	3.28						
	1	74	7.84	4	18.89	20	1.33		
	2	74	3.45	3	11.58				
	3	74	3.26	30	4.53				
2101ZZ	3	73	80.42						
	4	73	47.29						
	5	73	70.51						
	6	73	36.53						
	7	73	24.41						
	8	73	6.99						
	9	73	2.32						
	10	73	2.52						
	11	73	48.70						
	12	73	53.24						
	1	74	145.83						
	2	74	48.42						
	3	74	55.22						

APPENDIX D

PHYSICAL and CHEMICAL DATA

STORET RETRIEVAL DATE 75/01/27

210101
36 51 55.0 085 08 45.0
LAKE CUMBERLAND
21207 KENTUCKY

11EPALES
3

2111202
0180 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/29	10 05	0000	17.7		72	135	7.50	40	0.040	0.400	0.300	0.006
	10 05	0006	17.4	9.2		135	7.50	38	0.030	0.200	0.300	0.002K
	10 05	0015	16.0	8.6		125	7.50	37	0.030	0.300	0.300	0.005
	10 05	0030	15.1	9.0		125	7.40	36	0.040	0.200	0.300	0.011
	10 05	0050	14.4	9.0		130	7.40	36	0.040	0.200	0.330	0.006
	10 05	0075	13.8	9.2		130	7.30	36	0.040	0.200K	0.340	0.006
	10 05	0100	12.5	9.6		130	7.40	35	0.040	0.200	0.350	0.006
	10 05	0125	10.7	9.8		140	7.40	40	0.040	0.200K	0.370	0.006
	10 05	0150	9.7	9.6		145	7.40	42	0.040	0.200	0.390	0.006
	10 05	0186	9.4	9.2		145	7.40	40	0.040	0.200	0.390	0.009
73/08/21	10 35	0000	26.8	9.0	96	136	7.30	36	0.050	0.400	0.090	0.006
	10 35	0015	26.7	9.0		205	6.90	34	0.050	0.200	0.090	0.012
	10 35	0025	26.0	8.6		201	6.60	35	0.040	0.300	0.150	0.008
	10 35	0035	23.2			198						
	10 35	0050	20.4	4.0		188	6.30	34	0.040	0.200	0.380	0.012
	10 35	0071	17.1	5.2		171	6.20	28	0.040	0.200	0.360	0.009
	10 35	0087	15.4			157						
	10 35	0092	14.8	5.8		162	6.00	27	0.070	0.200	0.410	0.008
	10 35	0102	13.1			164						
	10 35	0130	10.3	5.0		167	5.90	36	0.060	0.200K	0.450	0.006
	10 35	0170	9.7	2.8		180	5.90	49	0.050	0.200K	0.450	0.008
73/10/25	11 15	0000	21.5		108	130	7.60	35	0.030	0.200K	0.120	0.007
	11 15	0005	21.5	7.0		128	7.60	36	0.030	0.200K	0.110	0.008
	11 15	0025	21.4	7.2		125	7.40	36	0.030	0.200K	0.110	0.009
	11 15	0055	21.2	6.2		125	7.00	34	0.030	0.200K	0.180	0.007
	11 15	0075	16.8	3.6		95	6.90	26	0.030	0.200K	0.370	0.007
	11 15	0110	12.2	0.8		102	6.90	38	0.040	0.200K	0.360	0.013
	11 15	0140	10.7	0.2		116	6.90	45	0.040	0.200K	0.370	0.010

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/01/27

210101
36 51 55.0 085 08 45.0
LAKE CUMBERLAND
21207 KENTUCKY

11EPALES 2111202
3 0180 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/29	10 05	0000	0.015	1.1
	10 05	0006	0.013	
	10 05	0015	0.014	
	10 05	0030	0.013	
	10 05	0050	0.015	
	10 05	0075	0.015	
	10 05	0100	0.018	
	10 05	0125	0.017	
	10 05	0150	0.017	
	10 05	0186	0.018	
73/08/21	10 35	0000	0.010	7.5
	10 35	0015	0.013	
	10 35	0025	0.012	
	10 35	0050	0.012	
	10 35	0071	0.013	
	10 35	0092	0.039	
	10 35	0130	0.020	
	10 35	0170	0.024	
73/10/25	11 15	0000	0.008	3.9
	11 15	0005	0.009	
	11 15	0025	0.009	
	11 15	0055	0.010	
	11 15	0075	0.020	
	11 15	0110	0.033	
	11 15	0140	0.043	

STORET RETRIEVAL DATE 75/01/27

210102
36 52 30.0 085 03 05.0
LAKE CUMBERLAND
21207 KENTUCKY

11EPALES
3

2111202
0125 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/29	13 45	0000	18.7		72	140	7.50	45	0.040	0.400	0.300	0.005
	13 45	0006	18.9	9.0		140	7.60	45	0.030	0.300	0.300	0.005
	13 45	0015	18.3	9.0		135	7.50	44	0.030	0.300	0.290	0.007
	13 45	0030	16.4	8.2		130	7.40	40	0.030	0.300	0.300	0.012
	13 45	0050	13.9	9.4		130	7.40	39	0.030	0.300	0.320	0.005
	13 45	0075	12.4	9.4		150	7.40	40	0.040	0.300	0.360	0.005
	13 45	0100	11.1	9.2		155	7.40	52	0.030	0.300	0.400	0.008
	13 45	0125	10.3	8.6		160	7.40	54	0.030	0.300	0.420	0.011
	13 45	0145	9.9	8.8		170	7.40	56	0.030	0.200	0.420	0.008
73/08/21	14 30	0000	28.1	9.0	42	144	7.70	39	0.060	0.600	0.060	0.009
	14 30	0015	27.4	9.0		139	7.50	36	0.050	0.300	0.060	0.007
	14 30	0025	25.5	7.6		138	7.10	37	0.040	0.300	0.160	0.006
	14 30	0048	20.6	4.0		122	6.50	36	0.050	0.200K	0.420	0.006
	14 30	0074	16.8	5.2		112	6.30	32	0.050	0.200K	0.400	0.006
	14 30	0100	14.1	4.9		117	6.20	53	0.040	0.200K	0.520	0.008
	14 30	0118	11.5			130	6.20	59	0.040	0.200K	0.500	0.005
73/10/25	10 40	0000	21.4		120	130	7.30	38	0.050	0.800	0.120	0.011
	10 40	0005	21.4	6.4		131	7.40	39	0.030	0.200K	0.110	0.008
	10 40	0015	21.4	6.8		130	7.30	38	0.030	0.200K	0.110	0.009
	10 40	0035	21.4	6.6		130	7.30	39	0.030	0.200K	0.110	0.006
	10 40	0055	20.6	1.8		120	7.00	39	0.030	0.200K	0.360	0.008
	10 40	0075	16.8	3.0		110	6.90	38	0.040	0.200K	0.410	0.010
	10 40	0095	14.0	1.4		130	6.90	53	0.040	0.200K	0.440	0.007

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/01/27

210102
36 52 30.0 085 03 05.0
LAKE CUMBERLAND
21207 KENTUCKY

11EPALES 2111202
3 0125 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/29	13 45	0000	0.013	1.8
	13 45	0006	0.012	
	13 45	0015	0.017	
	13 45	0030	0.014	
	13 45	0050	0.015	
	13 45	0075	0.018	
	13 45	0100	0.013	
	13 45	0125	0.015	
	13 45	0145	0.014	
73/08/21	14 30	0000	0.009	8.0
	14 30	0015	0.008	
	14 30	0025	0.008	
	14 30	0048	0.007	
	14 30	0074	0.011	
	14 30	0100	0.009	
	14 30	0118	0.009	
73/10/25	10 40	0000	0.011	3.6
	10 40	0005	0.009	
	10 40	0015	0.008	
	10 40	0035	0.010	
	10 40	0055	0.010	
	10 40	0075	0.015	
	10 40	0095	0.022	

STORET RETRIEVAL DATE 75/01/27

210103
36 54 05.0 085 02 05.0
LAKE CUMBERLAND
21207 KENTUCKY

11EPALES 2111202
3 0104 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/29	14 45	0000	19.5		60	135	7.70	47	0.040	0.400	0.280	0.005
	14 45	0006	19.4	8.8		130	7.70	47	0.040	0.300	0.290	0.006
	14 45	0015	19.2	9.0		130	7.60	46	0.040	0.300	0.290	0.007
	14 45	0030	18.3	9.0		125	7.60	43	0.040	0.300	0.280	0.011
	14 45	0050	15.0	9.2		125	7.60	41	0.030	0.300	0.300	0.005
	14 45	0075	11.6	9.6		125	7.50	39	0.040	0.300	0.360	0.006
	14 45	0097	10.8	9.4		125	7.50	40	0.040	0.300	0.380	0.003
73/08/21	15 30	0000	28.0	8.7	70	141	7.70	39	0.050	0.600	0.070	0.005
	15 30	0015	27.8	9.1		141	7.30	37	0.040	0.300	0.050	0.004
	15 30	0030	23.4	3.0		136	6.60	37	0.050	0.200	0.340	0.011
	15 30	0066	17.6	4.4		103	6.40	32	0.040	0.200K	0.380	0.006
	15 30	0090	15.2			85						
	15 30	0100	13.2	6.0		89	6.30	35	0.070	0.300	0.400	0.007
73/10/25	11 55	0000	21.6		108	134	7.20	40	0.040	0.400	0.130	0.006
	11 55	0015	21.5	6.6		130	7.30	37	0.040	0.200K	0.110	0.011
	11 55	0035	21.5	6.0		130	6.90	35	0.030	0.200K	0.370	0.008
	11 55	0056	20.0	1.2		121	6.90	36	0.030	0.200K	0.380	0.010

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/01/27

210103
36 54 05.0 085 02 05.0
LAKE CUMBERLAND
21207 KENTUCKY

11EPALES 2111202
3 0104 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/29	14 45	0000	0.015	2.4
	14 45	0006	0.014	
	14 45	0015	0.015	
	14 45	0030	0.014	
	14 45	0050	0.018	
	14 45	0075	0.026	
	14 45	0097	0.022	
73/08/21	15 30	0000	0.008	7.9
	15 30	0015	0.008	
	15 30	0030	0.013	
	15 30	0066	0.010	
	15 30	0100	0.029	
73/10/25	11 55	0000	0.017	2.5
	11 55	0015	0.012	
	11 55	0035	0.015	
	11 55	0056	0.016	

STORET RETRIEVAL DATE 75/01/27

210104
35 57 15.0 084 55 45.0
LAKE CUMBERLAND
21207 KENTUCKY

11EPALES 2111202
3 0097 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/29	13 50	0000	19.5		36	135	7.60	31	0.040	0.200K	0.260	0.006
	13 50	0005	19.5	9.4		135	7.60	32	0.060	0.200K	0.310	0.006
	13 50	0015	19.4	9.0		135	7.60	32	0.040	0.200K	0.260	0.007
	13 50	0030	18.3	9.2		135	7.50	33	0.040	0.200K	0.260	0.007
	13 50	0065	14.5	9.4		130	7.50	32	0.040	0.200K	0.290	0.006
	13 50	0090	12.6	9.2		130	7.50	33	0.040	0.200K	0.340	0.007
	13 50	0115	11.1	9.4		130	7.50	32	0.040	0.200K	0.350	0.008
	13 50	0130	10.5	9.4		130	7.40	33	0.060	0.200K	0.420	0.013
73/08/21	16 15	0000	28.0	8.6	60	142	7.90	40	0.050	0.400	0.070	0.004
	16 15	0006	28.0			141						
	16 15	0015	27.5	8.6		140	7.30	39	0.040	0.300	0.050	0.005
	16 15	0035	22.8	2.2		131	7.30	36	0.070	0.200K	0.340	0.005
	16 15	0062	18.0	2.8		97	7.30	36	0.050	0.200K	0.390	0.005
	16 15	0092	14.7	5.2		89	7.30	36	0.070	0.200K	0.410	0.007
73/10/25	13 50	0000	21.8		90	137	7.30	37	0.060	0.700	0.120	0.009
	13 50	0005	21.8	7.0			7.30	34	0.040	0.200K	0.110	0.009
	13 50	0015	21.5	7.0		127	7.30	34	0.040	0.200K	0.100	0.009
	13 50	0055	21.2	6.0		123	7.00	34	0.040	0.200K	0.150	0.008
	13 50	0070	17.4	2.2		106	6.80	35	0.030	0.200K	0.380	0.009
	13 50	0100	13.2	0.4		100	6.80	39	0.040	0.200K	0.360	0.007
	13 50	0121	11.0	0.4		98	6.70	37	0.040	0.200K	0.390	0.006

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/01/27

210104
36 57 15.0 084 55 45.0
LAKE CUMBERLAND
21207 KENTUCKY

11EPALES 2111202
3 0097 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/29	13 50	0000	0.019	2.3
	13 50	0005	0.022	
	13 50	0015	0.016	
	13 50	0030	0.016	
	13 50	0065	0.017	
	13 50	0090	0.019	
	13 50	0115	0.032	
	13 50	0130	0.024	
73/08/21	16 15	0000	0.008	7.6
	16 15	0015	0.008	
	16 15	0035	0.022	
	16 15	0062	0.015	
	16 15	0092	0.038	
73/10/25	13 50	0000	0.013	1.7
	13 50	0005	0.011	
	13 50	0015	0.011	
	13 50	0055	0.020	
	13 50	0070	0.018	
	13 50	0100	0.034	
	13 50	0121	0.039	

STORET RETRIEVAL DATE 75/01/27

210105
36 58 10.0 084 51 30.0
LAKE CUMBERLAND
21231 KENTUCKY

11EPALES
3

2111202
0136 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/29	13 10	0000	19.8		38	140	7.60	40	0.050	0.500	0.240	0.007
	13 10	0005	19.7	9.0		140	7.60	40	0.050	0.300	0.240	0.007
	13 10	0015	18.8	9.0		140	7.60	41	0.060	0.300	0.270	0.003
	13 10	0030	18.5	9.0		140	7.60	32	0.060	0.300	0.270	0.002
	13 10	0045	15.9	9.0		135	7.50	31	0.060	0.300	0.320	0.009
	13 10	0060	13.2	9.2		135	7.50	32	0.060	0.300	0.350	0.008
	13 10	0085	11.9	9.0		135	7.50	33	0.040	0.200K	0.340	0.003
73/08/22	10 00	0000	27.1	8.0	60	143	8.10	36	0.060	0.400	0.050	0.006
	10 00	0015	27.1	7.8		143	7.70	35	0.050	0.300	0.050	0.005
	10 00	0031	23.8			133						
	10 00	0041	22.3	3.4		126	6.50	32	0.060	0.200K	0.330	0.007
	10 00	0055	19.3			117						
	10 00	0090	14.7	4.0		93	6.90	35	0.080	0.200K	0.430	0.005
	10 00	0115	11.9	3.0		93	6.80	37	0.070	0.200K	0.450	0.005
	10 00	0132	10.6	3.0		94	6.70	39	0.060	0.200K	0.460	0.007
73/10/25	14 25	0000	21.6		108	139	7.30	38	0.040	0.300	0.120	0.005
	14 25	0005	21.5	7.2		135	7.30	38	0.040	0.200K	0.110	0.006
	14 25	0015	21.3	6.4		134	7.30	38	0.040	0.200K	0.110	0.006
	14 25	0035	21.2	6.4		132	7.30	39	0.040	0.200K	0.120	0.007
	14 25	0055	21.1	6.0		130	7.20	41	0.040	0.200K	0.120	0.008
	14 25	0070	17.3	0.4		114	6.90	46	0.040	0.200K	0.390	0.009
	14 25	0090	15.0	0.1		114	6.90	49	0.100	0.200	0.260	0.007
	14 25	0114	12.0	0.4		102	6.80	43	0.040	0.200	0.320	0.009

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/01/27

210105
36 58 10.0 084 51 30.0
LAKE CUMBERLAND
21231 KENTUCKY

11EPALES 2111202
3 0136 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/29	13 10	0000	0.017	2.3
	13 10	0005	0.018	
	13 10	0015	0.018	
	13 10	0030	0.020	
	13 10	0045	0.018	
	13 10	0060	0.021	
	13 10	0085	0.023	
73/08/22	10 00	0000	0.009	8.5
	10 00	0015	0.012	
	10 00	0041	0.022	
	10 00	0090	0.056	
	10 00	0115	0.037	
	10 00	0132	0.038	
73/10/25	14 25	0000	0.014	1.7
	14 25	0005	0.013	
	14 25	0015	0.013	
	14 25	0035	0.014	
	14 25	0055	0.014	
	14 25	0070	0.020	
	14 25	0090	0.027	
	14 25	0114	0.033	

STORET RETRIEVAL DATE 75/01/27

210106
36 58 45.0 084 42 55.0
LAKE CUMBERLAND
21231 KENTUCKY

11EPALES 2111202
3 0083 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/29	12 15	0000	17.8		24	140	7.60	35	0.060	0.300	0.230	0.010
	12 15	0005	17.8	8.4		140	7.60	36	0.060	0.200	0.230	0.004
	12 15	0015	17.7	8.6		130	7.60	36	0.060	0.200K	0.230	0.007
	12 15	0030	17.2	8.4		130	7.60	34	0.060	0.200K	0.220	0.006
	12 15	0050	16.9	8.2		130	7.60	35	0.080	0.200K	0.220	0.011
	12 15	0080	16.2	8.0		130	7.60	36	0.050	0.200K	0.230	0.007
	12 15	0100	12.5	8.8		130	7.60	37	0.050	0.200	0.320	0.011
73/08/22	10 55	0000	27.2	5.8	70	148	8.80	43	0.050	0.300	0.060	0.011
	10 55	0015	27.2	8.0		148	8.20	42	0.060	0.200	0.060	0.006
	10 55	0022	26.5			141						
	10 55	0047	20.7	2.8		120	6.70	42	0.060	0.200	0.400	0.005
	10 55	0058	18.3			109						
	10 55	0080	15.6	4.3		96	6.90	39	0.070	0.200	0.440	0.012
73/10/25	15 00	0000	21.8		84	160	7.30	42	0.050	0.500	0.120	0.005
	15 00	0015	21.5	6.2		156	7.30	43	0.040	0.300	0.110	0.012
	15 00	0045	21.4	6.0		154	7.30	39	0.050	0.200K	0.120	0.008
	15 00	0075	16.5	0.1		121	6.90	49	0.120	0.300	0.280	0.005
	15 00	0119	11.8	0.4		110	6.80	48	0.230	0.400	0.130	0.010

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/01/27

210106
36 58 45.0 084 42 55.0
LAKE CUMBERLAND
21231 KENTUCKY

11EPALES 2111202
3 0083 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/29	12 15	0000	0.027	1.2
	12 15	0005	0.026	
	12 15	0015	0.021	
	12 15	0030	0.024	
	12 15	0050	0.021	
	12 15	0080	0.023	
	12 15	0100	0.019	
73/08/22	10 55	0000	0.012	6.4
	10 55	0015	0.012	
	10 55	0047	0.019	
	10 55	0080	0.027	
73/10/25	15 00	0000	0.018	2.3
	15 00	0015	0.018	
	15 00	0045	0.017	
	15 00	0075	0.033	
	15 00	0119	0.054	

STORET RETRIEVAL DATE 75/01/27

210107
36 59 40.0 084 37 25.0
LAKE CUMBERLAND
21199 KENTUCKY

11EPALES
3

2111202
0064 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/29	10 10	0000	17.6		4	150	7.60	31	0.110	0.400	0.240	0.025
	10 10	0005	17.6	8.2		135	7.60	30	0.090	0.200	0.230	0.015
	10 10	0015	17.6	8.2		130	7.60	31	0.080	0.300	0.220	0.008
	10 10	0030	17.4	8.2		100	7.60	30	0.140	0.300	0.240	0.005
	10 10	0050	17.2	8.4		100	7.60	25	0.120	0.300	0.280	0.005
	10 10	0084	15.5	8.4		100	7.60	26	0.100	0.200	0.300	0.006
73/08/22	13 20	0000	26.9	7.4	38	148	8.20	42	0.050	0.500	0.100	0.006
	13 20	0015	26.8	6.6		148	7.70	41	0.060	0.200K	0.140	0.006
	13 20	0024	25.4			127						
	13 20	0026	25.7	5.0		126	6.70	27	0.080	0.200	0.140	0.007
	13 20	0045	21.5	5.0		121	6.90	36	0.080	0.200K	0.340	0.022
	13 20	0050	19.9			120						
	13 20	0060	18.0	6.0		114	7.00	47	0.050	0.300	0.460	0.006
73/10/25	15 30	0000	23.2		60	177	7.40	44	0.060	0.700	0.140	0.008
	15 30	0005	22.2	6.5		177	7.40	43	0.050	0.200K	0.130	0.008
	15 30	0015	21.8	5.6		170	7.30	42	0.040	0.200K	0.130	0.007
	15 30	0025	21.8	5.4		170	7.30	42	0.040	0.200K	0.130	0.008
	15 30	0043	21.2	3.2		155	7.10	40	0.070	0.200K	0.130	0.007

K VALUE KNOWN TO BE
LESS THAN INDICATED

45

STORET RETRIEVAL DATE 75/01/27

210107
36 59 40.0 084 37 25.0
LAKE CUMBERLAND
21199 KENTUCKY

11EPALES 2111202
3 0064 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/29	10 10	0000	0.054	1.2
	10 10	0005	0.054	
	10 10	0015	0.066	
	10 10	0030	0.066	
	10 10	0050	0.069	
	10 10	0084	0.066	
73/08/22	13 20	0000	0.019	3.6
	13 20	0015	0.016	
	13 20	0026	0.013	
	13 20	0045	0.024	
	13 20	0060	0.013	
73/10/25	15 30	0000	0.019	2.4
	15 30	0005	0.013	
	15 30	0015	0.013	
	15 30	0025	0.013	
	15 30	0043	0.029	

APPENDIX E

TRIBUTARY and WASTEWATER TREATMENT PLANT DATA

STORET RETRIEVAL DATE 75/01/13

21[illegible]A1 LS2101A1
36 [illegible] 00.0 085 08 30.0
CUMBERLAND RIVER
21167 7.5 CREELSBORO
O/CUMBERLAND LAKE
E BANK .8 MI BELO WOLF CREEK DAM
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/01	14	45	0.330	0.100K	0.014	0.005K	0.020
73/04/28	06	10	0.290	0.140	0.018	0.006	0.020
73/06/17	06	25	0.300	0.280	0.030	0.011	0.020
73/07/22	10	30	0.320	0.780	0.033	0.005K	0.020
73/08/19	09	10	0.350	1.150	0.042	0.015	0.025
73/09/16	09	35	0.315	0.440	0.056	0.005K	0.025
73/10/14	09	15	0.330	0.500	0.015	0.005K	0.015
74/01/05	13	05	2.300	0.300	0.010	0.005	0.035
74/01/20	06	30	0.320	0.100	0.010	0.010	0.035
74/02/02	09	50	0.352	0.200	0.020	0.010	0.040
74/02/17	08	00	0.360	0.600	0.025	0.010	0.065
74/03/17	06	30	0.380	0.200	0.020	0.005	0.035

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/01/13

2101A2 LS2101A2
36 50 00.0 084 20 30.0
CUMBERLAND RIVER
21 7.5 CUMBERLAND F
I/CUMBERLAND LAKE
HWY 90 BRDG IN CUMBERLAND FALLS ST PARK
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 N02&N03 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/14	13	00	0.220	0.270	0.066	0.007	0.055
73/04/15	10	00	0.210	0.260	0.048	0.006	0.030
73/05/12	13	00	0.198	1.000	0.032	0.007	0.200
73/05/13	13	30	0.210	0.820	0.058	0.026	0.195
73/06/17	12	00	0.330	1.050	0.078	0.008	0.110
	13	00	0.330	1.700	0.052	0.009	0.100
73/07/30	12	30	0.235	2.900	0.095	0.005K	0.035
73/07/31	10	00	0.250	3.900	0.160	0.020	0.037
73/08/18	13	00	0.300	3.500	0.120	0.017	0.092
73/08/19	11	00	0.294	1.320	0.198	0.015	0.065
73/09/22	12	00	0.290	0.420	0.110	0.037	0.105
73/09/23	10	00	0.290	0.420	0.105	0.042	0.100
73/10/30	12	00	0.500	0.200	0.032	0.028	0.045
73/10/31	11	00	0.480	0.350	0.032	0.024	0.065
73/11/10	13	00	0.232	0.375	0.064	0.028	0.050
73/11/11	14	00	0.216	0.400	0.032	0.016	0.040
74/01/12	14	00	0.312	0.100K	0.040	0.020	0.020
74/01/13	11	00	0.288	0.100K	0.040	0.010	0.020
74/01/15	12	00	0.288	0.700	0.050	0.010	0.020
74/01/16	13	30	0.288	0.900	0.045	0.010	0.025

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/01/13

210181 LS210181
36 46 30.0 085 00 00.0
INDIAN CREEK
21 7.5 WOLF CREEK D
T/CUMBERLAND LAKE
BRDG (ST HWY 1266) NEAR SEVENTY SIX FALL
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/31	12 30		0.915	0.240	0.018	0.007	0.020
73/04/29	08 45		0.740	0.380	0.052	0.013	0.035
73/06/17	09 05		1.440	0.720	0.037	0.008	0.040
73/07/22	10 00		1.440	0.330	0.031	0.007	0.015
73/08/19	08 45		1.100	1.900	0.046	0.010	0.020
73/09/16	09 00		0.700	0.280	0.037	0.007	0.015
73/10/14	08 40		0.560	0.800	0.036	0.008	0.015
73/11/18	09 00		0.580	0.600	0.028	0.012	0.030
74/01/05	15 10		1.280	0.400	0.010	0.010	0.030
74/01/20	08 45		1.010	0.400	0.025	0.015	0.020
74/02/02	10 00		0.780	1.200	0.115	0.006	0.028
74/02/17	14 15		1.040	1.000	0.080	0.010	0.030
74/03/17	08 55		0.870	1.000	0.075	0.010	0.030

50

1

STORET RETRIEVAL DATE 75/01/13

2101C1 LS2101C1
36 46 30.0 085 06 30.0
WILLIAMS CREEK
21 7.5 CUMBERLAND C
T/CUMBERLAND LAKE
ST RD 55A BRDG 1.5 MI W OF ARLOW
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/31	14	55	0.700	0.220	0.040	0.005K	0.005K
73/04/29	08	30	0.690	0.100K	0.034	0.005K	0.015
73/06/17	09	30	0.930	1.050	0.015	0.007	0.015
73/07/22	08	45	0.870	0.780	0.024	0.005K	0.010
73/08/19	08	20	0.600	1.530	0.050	0.007	0.020
73/09/16	08	40	0.252	0.380	0.038	0.005K	0.020
73/10/14	08	30	0.370	0.500	0.019	0.006	0.020
73/10/20	14	00	0.500	1.850	0.052	0.028	0.055
73/11/18	08	30	0.504	0.800	0.020	0.005K	0.030
74/01/05	14	45	1.520	0.100	0.010	0.010	0.025
74/01/20	08	15	1.100	0.600	0.025	0.005	0.005K
74/02/02	09	30	0.756	0.600	0.042	0.010	
74/02/17	14	00	1.180	1.700	0.090	0.010	0.050
74/03/17	08	30	0.880	0.700	0.045	0.005K	0.005K

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/01/13

21101D1 LS2101D1
36 46 30.0 094 59 00.0
OTTER CREEK
21 7.5 PARNELL
T/CUMBERLAND LAKE
ST HWY 90 BRDG 0.5 MI N OF ZULU
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/01	13	15	0.320	0.140	0.050	0.005K	0.010
73/04/29	09	20	0.270	0.100K	0.006	0.005K	0.015
73/06/17	10	00	0.240	0.930	0.015	0.005K	0.015
73/07/22	11	05	0.126	0.540	0.015	0.005K	0.020
73/08/19	10	00	0.100	1.200	0.013	0.006	0.040
73/09/16	10	50	0.300	1.050	0.042	0.005K	0.010
73/10/14	10	20	0.154	0.450	0.025	0.005K	0.010
73/11/18	09	30	0.460	0.400	0.012	0.005K	0.015
74/01/05	12	40	0.660	0.100	0.005K	0.005	0.009
74/01/20	09	10	0.580	0.300	0.020	0.005K	0.005K
74/02/02	09	30	0.616	0.500	0.015	0.015	
74/02/17	10	20	0.420	0.800	0.065	0.005K	0.010
74/03/17	09	20	0.340	1.500	0.125	0.005K	0.005K

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/01/13

2101E1 LS2101E1
36 49 02.0 084 53 00.0
BEAVER CREEK
21 7.5 PARNELL
T/CUMBERLAND LAKE
ST HWY BRDG 2 MI W OF MONTICELLO
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/01	12	45	1.020	0.460	0.115	0.030	0.050
73/04/28	14	45	0.610	0.620	0.176	0.066	0.115
73/06/17	10	00	0.080	1.035	0.065	0.008	0.050
73/07/22	12	30	1.820	0.100K	0.013	0.176	0.190
73/08/19	11	05	2.400	0.200	0.005K	0.400	0.450
73/09/16	16	25	2.200	0.400	0.032	0.610	0.650
73/10/14	12	00	2.000	0.650	0.010	0.650	0.700
73/11/18	11	30	0.020	0.150	0.012	0.005K	0.025
74/01/04	16	00	1.260	0.200	0.015	0.035	0.085
74/01/19	12	00	2.100	0.100K	0.025	0.080	0.090
74/02/01	14	00	1.840	1.300	0.055	0.060	0.075
74/02/16	11	20	1.520	0.425	0.055	0.090	0.115
74/03/16	11	00	1.700	0.500	0.052	0.090	0.130

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/01/13

2101F1 LS2101F1
36 56 00.0 084 46 00.0
MEADOW CREEK
21 7.5 MILL SPRINGS
T/CUMBERLAND LAKE
PRIVATE BRDG .5 MI W OF MILL SPRINGS
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/01	11	10	0.630	0.190	0.035	0.006	0.025
73/04/28	10	00	0.336	0.325	0.033	0.016	0.040
73/05/13	10	30	0.690	0.200	0.015	0.007	0.025
73/06/10	12	00	1.020	0.540	0.105	0.015	0.025
73/07/07	10	30	0.160	1.890	0.044	0.009	0.040
73/08/19	12	00	0.750	2.400	0.084	0.024	0.030
73/09/16	11	30	0.330	0.860	0.069	0.017	0.045
73/11/17	11	45	1.040	0.237	0.008	0.024	0.030
74/01/05	10	30	0.924	0.400	0.110	0.020	0.045
74/01/20	15	30	0.710	0.700	0.085	0.030	0.060
74/02/03	15	00	0.528	0.300	0.015	0.020	0.045
74/02/16	11	00	0.850	0.100	0.005K	0.012	0.020
74/03/30	12	00	0.430	0.700	0.027	0.009	0.070

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/01/13

210161 LS2101G1
36 59 30.0 085 02 30.0
LTLY CREEK
21 7.5 JAMESTOWN
T/CUMBERLAND LAKE
BANK 100 YRDS S HWY 619 0.5E JAMESTOWN
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/31	10	20	0.580	0.250	0.023	0.115	0.135
73/04/28	09	30	0.470	0.380	0.084	0.066	0.110
73/05/13	10	30	0.660	0.720	0.138	0.060	0.120
73/06/10	10	00	0.680	0.280	0.026	0.270	0.300
73/07/07	10	30	0.650	1.150	0.031	0.140	0.170
73/08/19	10	30	0.500	2.700	0.075	0.510	0.550
73/09/16	12	30	0.590	3.600	0.359	0.440	0.490
73/10/20	10	15	0.810	0.900	0.096	0.580	0.650
73/11/17	12	45	0.336	0.150	0.012	0.012	0.015
74/01/05	10	00	1.300	0.200	0.025	0.015	0.025
74/01/20	14	00	0.792	0.200	0.025	0.110	0.155
74/02/03	14	00	0.810	0.250	0.020	0.110	0.145
74/02/16	14	00	0.730	0.300	0.020	0.260	0.315
74/03/30	11	30	0.710	0.900	0.040	0.005	0.030

STORET RETRIEVAL DATE 75/01/13

2101H1 LS2101H1
37 02 30.0 084 53 00.0
HORSE CREEK
21 7.5 ELI
T/CUMBERLAND LAKE
BRDG ON LIGHT DUTY RD 1 MI E DORENA
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/31	12	30	0.630	0.240	0.017	0.008	0.015
73/04/28	10	30	0.480	0.200	0.017	0.011	0.020
73/06/10	11	00	0.910	0.130	0.016	0.012	0.020
73/07/07	11	30	0.920	0.340	0.022	0.021	0.025
73/08/19	11	30	0.220	3.600	0.110	0.022	0.030
73/09/16	13	30	0.110	1.400	0.132	0.007	0.025
73/10/20	12	00	0.048	0.300	0.016	0.028	0.060
73/11/17	10	45	0.740	0.150	0.008	0.005	0.025
74/01/05	11	00	1.300	0.100K	0.005	0.010	0.025
74/01/20	15	15	0.810	0.200	0.010	0.020	0.020
74/02/03	15	30	0.850	0.100K	0.015	0.015	0.015
74/02/16	13	00	0.672	0.100K	0.010	0.010	0.010
74/03/30	13	00	0.710	0.400	0.015	0.010	0.030

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/01/13

2101J1 LS2101J1
37 02 30.0 084 53 00.0
WOLF CREEK
21 7.5 ELI
T/CUMBERLAND LAKE
TRAIL .25 MI OFF DIRT RD 2 MI E DORENA
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO3-NO2 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/31	12	20	0.660	0.230	0.005K	0.007	0.010
73/04/28	10	15	0.640	0.380	0.138	0.007	0.020
73/05/13	12	15	0.820	0.100K	0.014	0.005K	0.010
73/06/10	10	45	0.850	0.290	0.016	0.005K	0.010
73/07/07	12	00	0.950	0.270	0.042	0.009	0.025
73/08/10	12	20	0.220	1.300	0.020	0.010	0.015
73/09/16	13	45	0.052	1.400	0.720	0.006	0.025
73/10/20	12	30	0.016	1.050	0.360	0.020	0.045
73/11/17	13	30	0.850	0.100K	0.012	0.016	0.016
74/01/05	11	30	1.300	0.100	0.010	0.010	0.025
74/01/20	15	30	0.850	0.100K	0.010	0.015	0.015
74/02/03	15	30	0.900	0.100	0.005	0.010	0.010
74/02/16	12	00	0.672	0.100K	0.010	0.005	
74/03/30	13	45	0.720	2.100	0.040	0.005	0.040

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/01/13

2101K1 LS2101K1
36 59 30.0 085 45 00.0
WHITE OAK CREEK
21 7.5 MILL SPRINGS
T/CUMBERLAND LAKE
END RD OFF HWY 235 0.5 MI WOF TRIMBLE
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/31	09 30		0.220	0.130	0.040	0.005K	0.015
	13 45		0.830	0.190	0.006	0.008	0.015
73/04/28	11 00		0.720	0.480	0.130	0.008	0.020
73/05/13	13 15		0.920	0.130	0.016	0.008	0.015
73/06/10	11 45		1.020	0.290	0.015	0.008	0.015
73/07/07	13 00		1.100	0.860	0.032	0.011	0.025
73/08/19	12 45		0.110	0.580	0.014	0.008	0.020
73/09/16	15 00		0.189	1.320	0.168	0.013	0.025
73/10/20	13 30		0.020	0.300	0.036	0.016	0.055
73/11/17	15 00		0.840	0.100K	0.008	0.016	0.016
74/01/05	14 30		1.300	0.300	0.035	0.015	0.025
74/01/20	16 20		1.180	0.100K	0.005K	0.015	0.015
74/02/03	17 00		1.200	0.100K	0.010	0.020	0.020
74/02/16	11 00		0.860	0.100	0.005	0.005	0.005
74/03/30	14 45		0.710	1.000	0.045	0.005	0.035

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/01/13

2101L1 LS2101L1
37 06 00.0 084 41 30.0
FISHING CREEK ARM
21 7.5 DELMAR
T/CUMBERLAND LAKE
BRDG CUMBERLAND PARKWAY 3 MI W SOMERSET
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 N02&N03 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/01	11	15	0.430	0.250	0.010	0.005K	0.020
73/04/28	10	30	0.410	0.340	0.079	0.006	0.015
73/05/13	09	45	1.840	0.660	0.170		
73/06/10	12	00	0.080	0.480	0.058	0.005K	0.010
73/07/07	10	30	0.040	0.290	0.009	0.005K	0.015
73/08/19	13	00	0.021	1.320	0.005K	0.037	0.040
73/09/16	15	20	0.017	1.700	0.540	0.005K	0.040
73/11/17	14	10	3.900	0.150	0.010		
74/01/05	10	00	0.792	0.200	0.010	0.015	0.040
74/01/26			0.630	0.200	0.010	0.015	0.050
74/02/03			0.672	0.400	0.050	0.010	0.045
74/02/16	10	30	0.630	0.300	0.005	0.010	0.035
74/03/30	11	00	0.610	0.300	0.020	0.005	0.030

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/01/13

2101M1 LS2101M1
37 02 30.0 084 36 00.0
SINKING CREEK
21 7.5 SOMERSET
T/CUMBERLAND LAKE
100 FT BELO CULVERT ON LGT DUTY ROAD
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00623 NITROGEN N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/01	09	41	1.800	0.260	0.069	0.250	0.290
73/04/22	09	45	1.440	0.580	0.160	0.210	0.310
73/05/13	10	30	1.840	0.580	0.170	0.290	0.390
73/06/10	09	30	2.700	0.670	0.357	0.650	0.700
73/07/07			0.090	2.730	0.072	0.005K	0.015
73/09/16	13	00	2.060	4.400	2.200		
73/10/20	15	30	0.504	0.825	0.036	0.040	0.042
73/11/17	10	30	4.100	0.100K	0.028		
74/01/05	09	30	1.850	0.300	0.060	0.130	0.185
74/01/26			1.500	1.100	0.140	0.250	0.450
74/02/16	09	45	2.000	1.100	0.390	0.890	0.970
74/03/30	09	40	1.600	1.000	0.170	0.310	0.440

K VALUE KNOWN TO BE
LESS THAN INDICATED

8

STORET RETRIEVAL DATE 75/01/13

2101NI LS2101NI
37 02 30.0 084 35 30.0
PITMAN CREEK
21 7.5 SOMERSET
T/CUMBERLAND LAKE
ST RD 1247 BRDG 2.5 MI S OFSOMERSET
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/01	09	25	0.780	0.100K	0.007	0.006	0.020
73/04/28	09	50	0.710	0.630	0.164	0.027	0.060
73/05/13	10	45	0.980	0.560	0.189	0.032	0.050
73/06/10	09	45	0.910	0.280	0.054	0.030	0.032
73/07/07	09	45	1.140	0.120	0.011	0.007	0.025
73/08/19	11	25	0.660	2.300	0.034	0.005K	0.025
73/09/16	14	00	0.010K	1.100	0.076	0.005K	0.035
74/01/05	11	45	1.300	0.100	0.010	0.015	0.033
74/01/26			1.010	0.500	0.025	0.045	0.080
74/02/16	09	50	0.870	0.100	0.030	0.030	0.045
74/03/30	09	30	0.800	0.600	0.035	0.055	0.095

K VALUE KNOWN TO BE
LESS THAN INDICATED

19

STORET RETRIEVAL DATE 75/01/13

2101P1 LS2101P1
36 59 30.0 084 29 30.0
BUCK CREEK
21 7.5 MAIL
T/CUMBERLAND LAKE
BY BOAT DOC 1.1 S NORTHFIELDON RD 769
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO3+NO2 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/01	10	20	0.510	0.170	0.007	0.006	0.025
73/04/28	09	10	0.330	0.270	0.048	0.008	0.020
73/05/13	15	00	0.530	0.420	0.063	0.020	0.045
73/06/10	10	30	0.042	0.490	0.033	0.005K	0.040
73/07/07	11	20	0.044	0.460	0.008	0.005K	0.025
73/08/19	12	10	0.050	3.100	0.042	0.005K	0.040
73/09/16	13	30	0.010K	1.760	0.102	0.005K	0.045
74/01/05	09	45	0.725	0.100	0.010	0.020	0.040
74/01/26			0.640	1.000	0.035	0.012	0.017
74/02/03			0.660	0.100	0.035	0.010	0.020
74/02/16	09	00	0.640	0.250	0.012	0.005	0.010
74/03/30	10	20	0.480	0.400	0.015	0.007	0.060

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/01/13

210101 LS210101
37 01 30.0 084 19 30.0
ROCKCASTLE CREEK
21 7.5 AWO
T/CUMBERLAND LAKE
HWY 194 BRDG 3.75 MI E OF MT VICTORY KY
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/05/12	13	15	0.220	0.440	0.058	0.010	0.060
73/06/17	13	45	0.252	0.720	0.147	0.008	0.069
73/07/22	18	30	0.078	0.170	0.130	0.030	0.030
73/08/19	10	30	0.050	0.560	0.015	0.005K	0.030
73/09/22	12	45	0.040	6.800	0.220	0.010	0.030
73/10/13	11	45	0.048	4.750	0.552	0.016	0.035
73/11/10	11	50	0.312	4.700	0.240	0.040	0.065
73/12/08	13	00	0.530	3.400	0.104	0.008	0.015
74/01/12	13	25	0.290	1.800	0.220	0.010	0.070
74/01/27	16	40	0.384	1.900	0.090	0.010	0.025
74/02/09	12	00	0.336	0.200	0.015	0.005	0.015
74/03/09	13	40	0.276	0.300	0.025	0.010	0.065

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/01/13

2101R1 LS2101R1
36 57 30.0 084 16 30.0
LAUREL RIVER
21 7.5 SAWYER KY
T/CUMBERLAND LAKE
END BALDROCK-LAUREL RD 2 MIS BALDROCK
11EPALES 2111204
0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/31	10 30		0.320	0.440	0.105	0.015	0.060
73/05/12	11 40		0.315	0.460	0.046	0.029	0.115
73/06/17	13 00		0.520	0.780	0.089	0.023	0.110
73/07/22	16 50		0.140	3.150	0.058	0.029	0.055
73/08/19	11 30		0.200	0.630	0.027	0.019	0.030
73/09/22	13 00		0.147		0.520	0.019	0.065
73/10/13	12 50		0.096		1.120	0.024	0.060
73/11/10	14 10		0.208	2.300	0.540	0.020	0.040
73/12/08	12 05		0.368	0.800	0.064	0.020	0.075
74/01/12	12 00		0.352	0.900	0.075	0.010	0.030
74/01/27	15 30		0.352	4.000	0.200	0.015	0.025
74/02/09	11 00		0.340	0.500	0.040	0.015	0.025
74/03/09	12 30		0.320	0.775	0.050	0.010	0.050

64

STORET RETRIEVAL DATE 75/01/20

2101S1 LS2101S1
36 55 00.0 084 25 30.0
BEAVER CREEK
21 7.5 MAIL
T/CUMBERLAND LAKE
BOWMAN RD BRDG 2 MI NW OF FUNSTOWN KY
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/04/01	09 45		0.027	0.100K	0.015	0.005K	0.010		
73/04/28	09 30		0.012	0.130	0.025	0.005K	0.010		
73/05/13	09 30		0.042	0.100K	0.044	0.005K	0.005K		
73/06/10	09 30		0.240	0.150	0.025	0.012	0.015		
73/07/07	09 15		0.044	1.600	0.040	0.005K	0.005K		
73/08/19	11 00		0.050	3.800	0.037	0.005K	0.010		
73/09/22	10 30		0.052	0.210	0.044	0.005K	0.005K		
73/10/20	12 00		0.016	0.100K	0.020	0.010	0.010		
73/11/17	11 00		0.072	0.100K	0.008	0.008	0.008		
74/01/05	10 00		0.064	0.100K	0.020	0.005	0.005		
74/01/27	13 45		0.060	0.100K	0.020	0.005	0.005		
74/02/03	14 00		0.064	0.100K	0.030	0.005K	0.005K		
74/02/16	09 45		0.184	0.200	0.065	0.010	0.010		
74/03/30	11 00		0.080	0.700	0.045	0.015	0.020		

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/01/13

21081T1 LS210IT1
36 43 30.0 084 32 30.0
S FORK CUMBERLAND RIVER
21 7.5 RARTELL
I/CUMBERLAND LAKE
HWY 92 BRDG 3 MI W OF SMITHTOWN
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/01	09 45		0.138	0.260	0.028	0.005K	0.045
73/04/28	12 10		0.132	1.100	0.147	0.007	
73/06/16	13 30		0.180	0.400	0.010	0.005K	0.045
73/07/22	10 00		0.025	0.220	0.031	0.005K	0.010
73/08/19	10 00		0.100	0.180	0.017	0.005K	0.020
73/09/16	08 30		0.075	0.270	0.063	0.005K	0.015
73/10/14	11 00		0.063	1.000	0.044	0.009	0.010
74/01/04	09 25		0.208	0.500	0.030	0.010	0.115
74/01/19	11 30		0.240	0.100K	0.020	0.005K	0.005K
74/02/01	13 15		0.200	0.100	0.025	0.005	0.020
74/02/16	10 30		0.168	0.600	0.050	0.005	0.010
74/03/16	10 00		0.144	0.400	0.040	0.005K	0.030

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 74/01/13

2101U1 LS2101U1
36 48 00.0 084 36 00.0
LITTLE S FORK CUMBERLAND RIVER
21 7.5 NEVELSVILLE
T/CUMBERLAND LAKE
FREEDOM CHURCH RD BRDGE
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/01	11 15		0.110	0.200	0.032	0.005K	0.015
73/04/28	13 55		0.110	0.350	0.070	0.007	0.030
73/06/16	14 50		0.180	0.560	0.008	0.007	0.015
73/07/22	09 30		0.200	0.330	0.016	0.005K	0.015
73/08/19	08 30		0.050	3.600	0.030	0.005K	0.010
73/09/16	09 30		0.240	0.560	0.048	0.005K	0.035
73/10/14	09 45		0.024	0.650	0.017	0.006	0.015
73/11/18	09 30		0.276	0.450	0.008	0.008	0.040
74/01/04	15 03		0.192	0.300	0.005	0.010	0.030
74/01/19	10 30		0.224	0.100K	0.030	0.005	0.005
74/02/01	16 00		0.184	0.100	0.005		0.005K
74/02/16	09 05		0.168	0.400	0.025	0.005	0.020
74/03/16	09 15		0.092	0.200	0.015	0.005K	0.005

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/01/13

2101V1 LS2101V1
36 52 30.0 084 37 00.0
SINKING CREEK
21 7.5 NEVELSVILLE
TUMBERLAND LAKE
ROCKY HILL RD BRDG .25 MI EZION CHURCH
11PALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/01	12	45	0.160	0.130	0.011	0.005K	0.022
73/04/29	10	45	0.110	0.200	0.105	0.007	0.025
73/05/13	10	00	0.094	0.150	0.048	0.006	0.015
74/01/04	11	40	0.210	0.600	0.145	0.005	0.015
74/01/20	12	45	0.288	0.700	0.030	0.005	0.010
74/02/03	15	30	0.176	0.100K	0.010	0.005	0.020
74/03/30	12	45	0.028	0.300	0.016	0.015	0.025

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/02/03

2101AA TF2101AA P003687
36 44 30.0 084 09 30.0
WILLIAMSBURG
21167 7.5 WILLIAMSBURG
T/CUMBERLAND LAKE
CUMBERLAND RIVER
11EPALES 2141204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/04/13	14 00		0.260	0.310	0.139	0.129	0.182	0.206	0.250
73/06/12	14 30		0.410	1.400	0.365	0.180	0.410	0.288	0.225
73/07/09	10 00		0.525	1.400	1.060	0.585	0.795	0.336	0.302
73/08/10	14 00		0.370	7.600	1.320	0.840	1.470	0.270	0.225
73/09/11	14 00		3.000	5.800	0.183	3.020	3.250	0.296	0.250
73/10/10	10 00		0.560	0.400	0.290	0.500	0.525	0.184	0.190
73/11/10	10 00		0.500	0.500K	0.260	0.620	0.610	0.228	0.218
73/12/10	10 00		0.500	0.500K	0.170	0.054	0.100	0.145	0.208
74/01/10	14 00		0.680	0.500K	0.097	0.170		0.243	0.264
74/02/15			0.440	1.000K	0.110	0.073	0.310	0.225	0.266
74/03/10	09 30		0.040	1.200	0.050K	0.050K	1.050	0.395	0.199
74/04/15			0.262	1.000K	0.010	0.610	0.610	0.250	0.330

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/02/03

2101EA TF2101EA P003787
36 49 00.0 084 51 30.0
MONTICELLO
21 7.5 MONTICELLO
T/CUMBERLAND LAKE
ELK CREEK/BEAVER CREEK
11EPALES 2141204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/04/17	11 00		0.155	39.000	23.300	12.400	16.000	0.241	0.260
CP(T)- 73/04/17	16 00								
73/05/17	11 00		0.190	37.000	22.500	11.600	15.000	0.233	0.258
CP(T)- 73/05/17	16 00								
73/06/18	11 00		0.071	33.600	2.800	2.220	12.500	0.248	0.251
CP(T)- 73/06/18	16 00								
73/07/17	11 00		0.360	28.000	13.000	12.600	14.000	0.246	0.212
CP(T)- 73/07/17	16 00								
73/08/17	11 00		1.380	26.500	7.500	8.200	8.600	0.204	0.251
CP(T)- 73/08/17	16 00								
73/09/17	11 00		0.990	24.800	17.850	18.500	19.500	0.210	0.194
CP(T)- 73/09/17	16 00								
73/10/17	11 00		2.100	29.000	17.000	4.150	4.400	0.194	0.197
CP(T)- 73/10/17	16 00								
73/11/19	10 00		3.400	33.000	21.000	15.800	18.800	0.206	0.198
CP(T)- 73/11/19	15 00								
73/12/17	11 00		1.400	48.000	20.000	14.000	16.000	0.214	0.204
CP(T)- 73/12/17	16 00								
74/01/17	11 00		0.440	25.000	12.900	11.600	12.500	0.250	0.363
CP(T)- 74/01/17	16 00								
74/02/19	11 00		0.640	18.000	9.000	14.000	14.500	0.264	0.257
CP(T)- 74/02/19	16 00								
74/03/18	11 00		0.800	21.000	15.700	13.500	13.500	0.217	0.296
CP(T)- 74/03/18	16 00								

STORET RETRIEVAL DATE 75/02/03

2101GA TF2101GA P001096*
37 03 12.0 085 04 40.0
RUSSELL SPRINGS
21 7.5 RUSSELL SPRI
T/CUMBERLAND LAKE
BIG LILY CREEK
11EPALES 2141204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/04/23	09	00	0.014	18.000	8.200	6.100	8.800		
73/05/30	09	00	0.140	21.000	6.000	9.900	14.000		

STORET RETRIEVAL DATE 75/02/03

2101NA AS2101EA P011046*
37 06 20.0 084 3' 30.0
SOMERSET #1
21 7.5 SOMERSET
T/CUMBERLAND LAKE
PITMAN CREEK
11EPALES 2141204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/04/16 CP(T)- 73/04/17	09 00		0.890	5.400	0.250	3.400	4.200	1.770	1.550
73/05/16 CP(T)- 73/05/17	09 00		0.525	6.000	0.345	7.350	7.800	1.590	1.670
73/06/17 CP(T)- 73/06/18	09 00		0.640	3.000	0.730	0.640	3.400	1.650	1.700
73/07/16 CP(T)- 73/07/17	09 00		0.090	11.500	1.470	4.600	6.000	1.700	1.660
73/08/27 CP(T)- 73/08/28	09 00		0.066	6.600	0.390	0.384	0.920	1.430	1.460
73/09/17 CP(T)- 73/09/18	09 00		0.022	8.800	6.150	8.120	9.900	1.500	1.300
73/10/15 CP(T)- 73/10/16	09 00		0.440	17.500	6.600	8.050	11.000	1.310	1.270
73/11/16 CP(T)- 73/11/17	09 00		0.110	15.000	7.000	7.600	8.300	1.320	1.260
73/12/17 CP(T)- 73/12/18	09 00		0.330	21.000	9.700	9.600	12.000	1.000	0.960
74/01/14 CP(T)- 74/01/15	09 00		1.440	5.450	0.390	2.800	3.430	1.980	2.020
74/02/17 CP(T)- 74/02/18	09 00		0.920	7.300	1.280	5.520	5.800	1.320	1.600
74/03/17 CP(T)- 74/03/18	09 00		0.560	9.292	1.775	2.500	3.500	1.420	1.350

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